

## COMPOSITING STACK SAMPLE FILTERS

**Purpose** This Meteorology and Air Quality Group (MAQ) procedure describes the process to composite and ship stack sample filters to an off-site commercial analytical laboratory while maintaining proper chain of custody.

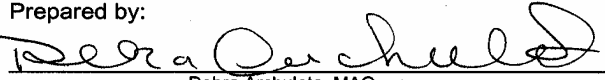
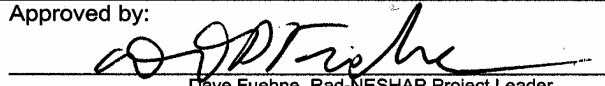
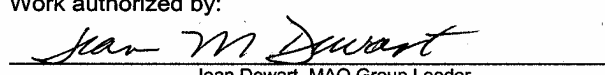
**Scope** This procedure applies to the preparation of stack sample filters, collected from sampled stacks at Los Alamos National Laboratory (LANL) as part of the Rad-NESHAP Project, for radiochemical analyses by an off-site laboratory.

**In this procedure** This procedure addresses the following major topics:

Topic	See Page
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Receiving and Storing Stack Sample Filters	5
Preparing to Composite Stack Sample Filters	6
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**Hazard Control Plan** The hazard evaluation associated with this work is documented in Attachment 1: Initial risk = **minimal**. Residual risk = **minimal**. Work permits required: none.  
First authorization review date is one year from group leader signature below; subsequent authorizations are on file in group office.

**Signatures**  
(continued on  
next page)

Prepared by:  Debra Archuleta, MAQ	Date: 5/5/03
Approved by:  Dave Fuehne, Rad-NESHAP Project Leader	Date: 5/5/03
Work authorized by:  Jean Dewart, MAQ Group Leader	Date: 5/5/03 05/08/03


04/28/03

### CONTROLLED DOCUMENT

This copy is uncontrolled if no signatures are present or if the copy number stamp is Black. Users are responsible for ensuring they work to the latest approved revision.

## General information about this procedure

### Signatures (continued)

Prepared by:  Terry Morgan, Quality Assurance Officer	Date: 5/5/03
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### Attachments

This procedure has the following attachments:

Number	Attachment Title	No. of pages
1	Hazard Control Plan	2
2	Shipping Information example	1
3	Letter to analytical laboratory	1

### History of revision

This table lists the revision history and effective dates of this procedure.

Revision	Date	Description Of Changes
0	12/15/95	New document.
1	7/16/97	Compositing location, process, and management changes.
2	2/2/99	Process and form changes.
3	8/23/01	Add HCP as Attachment 1, better explain reasons for hazard mitigations, and revise many steps.
4	3/29/02	Quick change to document compliance with DOT regulations for shipping radioactive material.
5	5/7/03	Deleted chapter on storage at TA-55 to reflect that samples no longer stored at TA-55.

### Who requires training to this procedure?

The following personnel require training before implementing this procedure:

- MAQ personnel assigned to composite stack sample filters and prepare it for shipment.

Annual retraining is required, and will be by self-study (reading) training.

### Training method

The training method for this procedure is **on-the-job** training by a previously trained individual and is documented in accordance with the procedure for training (MAQ-024).

## General information, continued

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**Prerequisites** In addition to training to this procedure, the following training is also required before performing this procedure:

- Radiological Worker
- Training by HSR-1, under provisions of Radiological Surveillance Authorization Agreement, in contamination survey methods (this allows personnel to conduct rad contamination surveys in place of an RCT)

An “L” or “Q” level security clearance (or escort) is required to enter TA-55.

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**Definitions specific to this procedure** Compositing: The process of assembling together radioactive particulate stack sample filters that were collected over a specified time period.

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**References** The following documents are referenced in this procedure:

- MAQ-024, “Personnel Training”
- MAQ-026, “Deficiency Reporting and Correcting”
- 49 CFR 173, Subpart I, Department of Transportation regulations for transport of “Class 7 (Radioactive) Materials”

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**Note** Actions specified within this procedure, unless preceded with “should” or “may,” are to be considered mandatory guidance (i.e., “shall”).

## Worker safety

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### Performing work safely

**DO NOT perform work under conditions you consider unsafe.** Before beginning work described in this procedure, review safety needs and requirements, identify hazards, and develop hazard mitigation measures. Be aware that facility configurations and hazards may change between visits. Hazards to assess include, but are not limited to the following:

**Radiological hazards** – The TA-54-1001 area where filters are composited is radiologically controlled. The filter compositing process requires one or two MAQ personnel. **The person working in the hood must wear a lab coat and gloves to handle the filters.**

**Exhaust hood** - The exhaust hood must be within the ESH-5 certification date, configured correctly, and functioning correctly in order to be safely used for the filter compositing process. Steps in this procedure specify the correct hood configuration and operating parameters.

**Contact the Rad-NESHAP Project Leader if unsafe working conditions are found.**

## Receiving, transporting, and storing stack sample filters

**Overview** Stack sample filters are collected weekly from each sampled stack and delivered to HPAL for gross alpha counting, gross beta counting, and gamma spectroscopy. After counting is complete, HPAL retains the filters, which are individually stored in their original glassine envelopes inside Ziplock bags for one week. When custody of counted filters is transferred back to MAQ, the samples are transported to the locked cabinet at TA-54-1001 Cave. Trained MAQ personnel separate the filters and place them, by stack, in a small index box with dividers labeled for each stack. The filters each remain in individual glassine envelopes throughout the separation process.

**Storing the filters** Keep the small index box containing the filters, each in individual glassine envelopes, in the locked MAQ sample custody storage file cabinet in TA-55, Building PF-2, Room 123. Record the date, time, sample identification, and the name of the individual placing the samples in the storage cabinet in the Sample Transportation and Storage Logbook. Keep the Sample Transportation and Storage Logbook in file cabinet in TA-54-1001 Cave.

**Steps to receive and store filters** Perform the following steps to receive and store stack sample filters:

Step	Action
1	Accept custody of the filters from HPAL by signing the HPAL Submittal Forms.
2	Transport the samples to TA-54-1001 (the "Cave").
3	Separate the filters by stack and place each filter (still in glassine envelopes) in the small index box in front of divider label for the appropriate stack identifier.
4	Place the small index box containing the filters in the MAQ locked stack sample storage cabinet in TA-54-1001 Cave.
5	Record the following information in the Sample Transportation and Storage Logbook: <ul style="list-style-type: none"> <li>• Date.</li> <li>• Time.</li> <li>• Sample identification.</li> <li>• That the samples were stored in the MAQ locked cabinet at TA-54-1001 Cave.</li> <li>• Name.</li> <li>• Signature.</li> </ul>

## Preparing to composite stack sample filters

**Overview** Before filters can be composited, the list of filters to be composited, blank filters, and various equipment and supplies must be obtained.

**Ensure all alpha and beta data are loaded** Do not perform the compositing process until all the electronic analytical data results for alpha and beta counts have been loaded into the MS Access database. If all these data are not present, the printed forms may be incorrect.

**Note on compositing controls** The compositing of the stack filters is conducted in a controlled area within building 1001 because of the potential for the presence of a radioactive filter, though the radiological risk to personnel is very small. However, the use of the controlled area and the careful actions to prevent contamination spread are necessary to prevent cross-contamination of the filters.

**NOTE:** The samples may be stored outside a controlled area because the closed container is considered the “controlled area.”

**Steps to prepare for compositing** Perform the following steps to gather required supplies and prepare for compositing sample filters:

Step	Action
1	Obtain from Access database the following: <ul style="list-style-type: none"><li>Stack filter Composite Checklist</li><li>Chain of Custody and Screening Data for Composite Shipping.</li></ul>
2	Assemble 100 blank filters. <b>Note:</b> The blanks are used as composite blanks (quality control checks) and are processed identically to the composite sample filters.

*Steps continued on next page.*

## Preparing to composite stack sample filters, continued

Step	Action
3	Chose two samples from a previous quarter, to be submitted as duplicates.
4	<p>Assemble the following equipment and supplies:</p> <ul style="list-style-type: none"> <li>• Latex surgical “Radworker” gloves</li> <li>• Millipore filter cutter or scissors to cut the filters</li> <li>• Small (4”), medium (8”), and large (12”) square Ziplock bags</li> <li>• Permanent marker to label bags</li> <li>• Stack filter Composite Checklist.</li> <li>• Custody tape to seal large bags</li> <li>• Pen (blue or black ink)</li> <li>• Forceps to handle filters</li> <li>• Kimwipes to clean equipment</li> <li>• Fantastic spray solution to clean equipment</li> </ul>
5	<p>Label two small Ziplock bags for each stack to be composited. Record the ESIDNUM, year, and quarters (i.e., 03002914-97Q12) on the labels. If a second person will assist, this step can be done at the time the filters are being handled (see next chapter).</p> <p><b>Note:</b> One bag of composite filters will be sent to the analysis laboratory while the other will be retained at LANL.</p>

## Compositing stack sample filters

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### Overview

At intervals decided by MAQ group management, stack sample filters are composited at TA-54-1001 for analysis. A given stack's filters covering the time period of interest are compiled and cut in half. One half is sent to an off-site laboratory for radiochemical analyses. The remaining half is retained by MAQ at LANL to be used in case of sample or data loss during shipping or analyses.

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### Personnel required

This procedure may be performed by one or two individuals:

#### **2 people:**

Second person remains outside the controlled area and performs all steps requiring labeling of 4x4 bags, recording information, and completing forms.

First person performs the actual composting and related physical work inside the controlled area. This person verifies all stack samples and calls out data to person outside control area.

#### **1 person:**

Before working in hood, perform the steps to verify that stack filters on the checklist are all in the index storage box and sign and date the checklist. Remove all the filters to be composited before handling any filters. Label all 4x4 bags with ID numbers for each stack sample to be composited (i.e., 03002914-97Q12).

## Compositing stack sample filters, continued

### Steps to composite the filters

Perform the following steps to composite the filters:

Step	Action
1	When one person does this process, check that all filters are present by checking each filter against the printed checklist. Also check the date on the filter against the checklist. Place stack samples that will not be composited in labeled 4x4 bags and return to locked file cabinet. Then pre-label all 4x4 bags with ID numbers for each stack sample to be composited.
<b>Dressing in PPE and Checking/Preparing the Hood:</b>	
2	Put on a lab coat before entering the controlled area around the hood.
3	Verify that the hood is within the ESH-5 certification date.
4	Put on latex surgical gloves.
5	Verify that the hood door is at the proper height (14 inch opening) and that the “Conditions for Use” listed on the yellow ESH-5 label are met before turning on the hood.  <b>Do not perform work in the hood if discrepancies are observed.</b>
6	Turn on the hood and verify proper operation. If the magnehelic gage reads less than 0.15 in. water column (W.C. or H <sub>2</sub> O), contact the Rad-NESHAP Project Leader or building supervisor.  <b>Note:</b> The magnehelic gage must read <b>at least 0.15 in. H<sub>2</sub>O in order to safely perform work</b> in the hood.
7	Label a large Ziplock bag as “Rad Trash” and tape it to the inside right wall of the hood. Deposit all used Kimwipes in this bag.
8	Clean the fume hood, scissors, and forceps with Fantastic spray and Kimwipes. Dispose of all Kimwipes and <u><b>used gloves</b></u> in the radioactive trash bag.
9	Label an 8x8 Ziplock bag with “LANL.” Label a second 8x8 Ziplock bag with the name of the analytical laboratory that will be performing the analyses.
10	Tape these open bags to the back inside wall of the hood so you may drop each small Ziplock bag-containing composite cut filters into the bags.

*Steps continued on next page.*

## Compositing stack sample filters, continued

Step	Action
11	Have a box of Kimwipes inside the hood. Pull a clean Kimwipe for each stack to be composited.
<b>Preparing Filters:</b>	
12	Retrieve the stack sample filter storage box from the TA-54-1001 locked sample custody file cabinet. <b>Note:</b> The box contains separated stack filters for each sampled stack.
13	Record the following information in the Sample Transportation and Storage Logbook: <ul style="list-style-type: none"> <li>• Date</li> <li>• Time</li> <li>• Sample identification</li> <li>• That the samples were removed from the locked cabinet at the TA-54-1001 for compositing</li> <li>• Name of person removing the samples from the cabinet</li> </ul>
14	Change to a clean pair of latex surgical gloves.
15	Remove the proper filters (in their glassine envelopes) for the first stack to be composited from the index box. Verify that the filters are all from the proper stack and match up with the dates on the list. If there is a second person, this person checks off the filters actually composited on the Stack Filter Composite Checklist. <b>Note:</b> If one or more of the required filters are missing, contact the Rad-NESHAPs Project Leader and note it on the Stack Filter Composite Checklist. Proceed with the compositing process for the remaining filters. Initiate a deficiency report in accordance with procedure MAQ-026, "Deficiency Reporting and Correcting."
16	Return any filters, in glassine envelopes, not to be composited to the 4x4 Ziplock bag(s) and return the bag(s) to the MAQ locked storage file cabinet.
17	In the hood, once all filters for a stack are properly identified, remove them from the glassine envelopes onto a clean Kimwipe. Arrange the filters in two approximately equal-sized piles with the contaminated sides of the top and bottom filters of each pile facing the center of the pile. Dispose of the glassine envelopes in the radioactive trash.

*Steps continued on next page.*

## Compositing stack sample filters, continued

Step	Action
<b>Cutting Filter</b>	
18	Carefully cut the two piles of filters in half using the scissors.
19	If there is a second person, have the person outside the controlled area (person 2) verify the date on the filter against the date on the Stack Filter Composite Checklist. Note any relevant comments (e.g., missing or mishandled filters) on this form. If there is only one person, this step was done previously (step 1).
20	Using the forceps, pick up one half of the cut filters from each pile and place one half in one of the small Ziplock bags labeled for the stack to be shipped.
21	Using the forceps, pick up the remaining half and place in the other small Ziplock bag labeled for the stack to remain at LANL.
22	Close and seal the two small Ziplock bags. Place one bag in the medium Ziplock bag labeled with the name of the analysis laboratory. Place the other bag in the medium Ziplock bag labeled "LANL."
23	Decontaminate the scissors, forceps, and gloves using Fantastic spray and a clean Kimwipe from the box. Place the used Kimwipe in the large Ziplock bag labeled "Rad Trash."
24	Remove the Kimwipe from the counter top where the cutting was done and place it in the "Rad Trash" bag.
25	Place the clean scissors and forceps on top of the clean Kimwipe removed from box.
26	Repeat steps 14 through 25 for each stack to be composited, then continue with Step 27.
27	Close and seal the medium Ziplock bags.
<b>Decontaminating Equipment and Exiting Area:</b>	
28	Decontaminate the fume hood, scissors, and forceps using Fantastic spray and Kimwipes. Dispose of all used Kimwipes and gloves in the "Rad Trash" bag.
29	Close and seal the radioactive trash Ziplock bag.
30	Check the out side of the radioactive trash bag with field instrument. This is located next to exit of control area. If no activity is detected, label the bag with your name and date. Place them in the radioactive trash container in the controlled area.
31	Turn off the hood.
32	Call the facility waste coordinator to generate a Chemical Waste Disposal Record (CWDR) and arrange for radioactive trash pick-up and disposal.

*Steps continued on next page.*

## Compositing stack sample filters, continued

Step	Action
33	Label a large Ziplock bag with the sample year, time period, and the note "Retained Composite Filters."
34	Put the medium Ziplock bags into the large Ziplock bags labeled in Step 33 and return the large Ziplock bag(s) containing retained composite sample halves to the locked sample custody filing cabinet in TA-54-1001.
35	Record the following information in the Sample Transportation and Storage Logbook: <ul style="list-style-type: none"> <li>• Date</li> <li>• Time composite samples were returned to the TA-54 cabinet</li> <li>• Sample identification</li> <li>• Name of Person returning the samples to the cabinet</li> </ul>
36	Remove lab coat and hang the coat on the rack next to the controlled area.
37	Monitor hands and feet using the hand monitor before leaving the controlled area. Also monitor the medium bags containing the composite samples to be shipped to the analysis laboratory if they must immediately leave the controlled area.
38	If contamination is detected during monitoring, call an RCT using the phone on the wall near the hood.  <b>Note:</b> The RCT phone number is posted on the white board next to the phone.
<b>Recording Required Information:</b>	
39	Make a photocopy of Chain of Custody and Screening data for Composite Shipping and the cover memo to the off-site laboratory detailing requested analyses (Attachment 3).
40	Sign the entry in the Sample Transportation and Storage Logbook documenting the removal of the samples from the locked cabinet.
41	Record the date and time the retained sample composite halves were returned to the locked sample storage cabinet on the photocopy of the Chain of Custody and Screening data for Composite Shipping. This becomes the c-of-c for the retained samples.
42	Put the original documents(s) into large Ziplock bags. These bags will prevent contamination of the paperwork during shipping and/or storage.

*Steps continued on next page.*

## Compositing stack sample filters, continued

Step	Action
43	Insert the medium Ziplock bags to be shipped (each containing small Ziplock bags of composite filter halves) in a large Ziplock bag(s) labeled with the sample year and time period. Seal large bag with security tape, date and initial.
44	File the photocopies from Step 39 in the sample compositing files at the TA-54, 1001 with retained samples.

## Shipping composite filters

### Shipping composited filters

MAQ group management determines when the composited filters are shipped for analyses (normally every 6 months). Retain the composited filters in the locked sample custody file cabinet in the TA-54-1001 until shipping.

### Steps to ship composited filters

Perform the following steps to ship the composited the filters:

Step	Action
1	<p>Complete or collect the following paperwork:</p> <ul style="list-style-type: none"> <li>Shipping Manifest (create and complete on LANL web)</li> <li>Chain of Custody and Screening data for Composite Shipping, detailing levels of gross alpha, beta, and gamma radiation</li> <li>Shipping Activity Memo detailing the total amount of activity in the shipped samples per unit mass of sample (not including the mass of the packaging) (Attachment 2)</li> </ul> <p><b>Caution: Ensure that this value is less than 2 nanocuries per gram, in order to comply with DOT regulations.</b></p> <ul style="list-style-type: none"> <li>Letter to the analytical lab detailing the requested analyses to be performed on the composited samples (Attachment 3)</li> </ul>
2	Remove the composite sample filters to be shipped from the TA-54 locked sample storage cabinet. Record the removal of the composite filters in the Transportation and Storage logbook.
3	Monitor the medium Ziplock bag containing the composite sample filters to be shipped using the portable survey instrument. If contamination is found, contact the facility RCT and decontaminate the bag in accordance with the RCT's instructions.
4	Survey hands and feet before leaving the controlled area.
5	Assemble the large Ziplock bag(s) containing the composited samples to be shipped with the associated paperwork.
6	Transport the samples and associated paperwork to the BUS-4 shipping office at SM-41 for shipment.
7	Give the Shipping Manifest and the Activity Memo (Attachment 2) to BUS-4 personnel. BUS-4 will "clock in" the shipment.
8	Record the date and time the samples are turned over to BUS-4 for shipping on the Stack Composite Sample Data Form and Chain of Custody Record(s) and sign the forms.

*Steps continued on next page.*

## Shipping composite filters, continued

Step	Action
9	Double-check that all items are present to be placed in the shipping box at step 11, then sign to verify this on the Stack Composite Sample Data Form and Chain of Custody Record.
10	After signing at the BUS-4 counter, make a photocopy of the Stack Composite Sample Data Form and Chain of Custody Record(s) for MAQ records.
11	Obtain a Federal Express shipping box from the Shipping Office and include the following in the shipment: <ul style="list-style-type: none"> <li>• Composite samples sealed in large bag with custody tape.</li> <li>• Any other sample materials (e.g., for QC purposes) that are listed on the chain of custody form.</li> <li>• Original Stack Chain of Custody and Screening Data For Composite Shipping (sealed inside the large Ziplock bag(s)).</li> <li>• Cover letter to analytical lab (sealed inside the large Ziplock bag(s)) (Attachment 3).</li> </ul>
12	Give the box to BUS-4 at the SM-31 shipping counter for shipment. BUS-4 will attach a copy of the Shipping Manifest and Activity Memo to the outside of the box and place the box on a rack for pick-up by Federal Express.
13	Retain a copy of the Shipping Manifest for MAQ records.

## Records resulting from this procedure

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### Records

The following records generated as a result of this procedure are to be submitted as records to the records coordinator **within one week of shipping composited filters**:

- Photocopy of Chain of Custody and Screening Data For Composite Shipping (from Access database)
- Copy of Shipping Manifest
- Photocopy of letter to the analytical laboratory detailing the requested analyses (Attachment 3)

## HAZARD CONTROL PLAN

1. The work to be performed is described in this procedure.

### “Compositing Stack Sample Filters”

2. Describe potential hazards associated with the work (use continuation page if needed).

A. Contamination from handling filters with potential particulate activity.

3. For each hazard, list the likelihood and severity, and the resulting initial risk level (before any work controls are applied, as determined according to LIR300-00-01, section 7.2)

Improbable / Negligible = Minimal

Overall *initial* risk: ☒ Minimal ☐ Low ☐ Medium ☐ High

4. Applicable Laboratory, facility, or activity operational requirements directly related to the work:

☐ None ☒ List: Work Permits required? ☒ No ☐ List:

LIR402-700-01, “Occupational Radiation Protection Requirements”

LIR405-10-01, “Packaging and Transportation”

### HAZARD CONTROL PLAN, continued

5. Describe how the hazards listed above will be mitigated (e.g., safety equipment, administrative controls, etc.):

A: Use of appropriate PPE (gloves, lab coat), work done in hood located in a control area at TA-54, 1001. Appropriate radiological monitor available, RCT phone number posted by phone in case of contamination.

**NOTE:** The hazard controls are intended as much to prevent cross-contamination of the filters as to prevent personnel contamination.

6. Knowledge, skills, abilities, and training necessary to safely perform this work (check one or both):

☒ Group-level orientation (per MAQ-032) and training to this procedure.

☒ Other → See training prerequisites on procedure page 3. Any additional describe here:

7. Any wastes and/or residual materials? (check one) ☐ None ☒ List:

Paper towels, gloves, and filter bags used in the process of cutting filters.

8. Considering the administrative and engineering controls to be used, the *residual* risk level (as determined according to LIR300-00-01, section 7.3.3) is (check one):

☒ Minimal ☐ Low ☐ Medium (requires approval by Division Director)

9. Emergency actions to take in event of control failures or abnormal operation (check one):

☐ None ☒ List:

A: Notify HSR-1 RCT for area.

B: Use decontamination material as Fantastic® cleaner, paper towel, gloves.

C: Notify MAQ project and team leaders

Signature of preparer of this HCP: This HCP was prepared by a knowledgeable individual and reviewed in accordance with requirements in LIR 300-00-01 and LIR 300-00-02.

Preparer(s) signature(s)

Name(s) (print)

/Position

Date

Signature by group leader on procedure title page signifies authorization to perform work for personnel properly trained to this procedure. This authorization will be renewed annually and documented in MAQ records. Controlled copies are considered authorized. Work will be performed to controlled copies only. This plan and procedure will be revised according to MAQ-022 and distributed according to MAQ-030.

# Shipping Information

## MAQ AIR QUALITY

To: Tom Houston  
From: Debra Archuleta, J978/7-0295  
Subject: Samples being sent for radioactivity analysis

These air filter samples are being shipped to an analytical laboratory for radioactivity analysis to determine specific levels of uranium, plutonium, thorium and americium activities. These are environmental stack samples, and are expected to contain only low-levels of radioactivity. The major isotopes are presently unknown, but the samples might reasonably be expected to contain traces of: U, Pu, and the natural radionuclides found in the dust around Los Alamos.

The samples were screened (Table 2 attached for your reference), and the sum total of all samples for all alpha, beta, and gamma activity has been calculated to be:

**0.01 nanocuries/gram of sample, net weight.**



# Los Alamos

## NATIONAL LABORATORY

**Environment, Safety, and Health Division**

Los Alamos, New Mexico 87545  
(505) 665-8855  
FAX 665-8858

Date:

Refer to: MAQ:

Dr. Ron Chessmore  
Wastren - Grand Junction  
2597 B 3/4 Road (Box 14000)  
Grand Junction, CO 81502-5504

**SAMPLE SHIPMENT - Glass-fiber Stack Filter composites [complete set RxxQyy]**

Dear Dr. Chessmore:

Enclosed with this letter are ?? glass-fiber filter composite samples for which we require analyses under our purchase order number **21596-001-0-25**. Please note the change in PR # for FY 01. You have previously received a Statement of Work for samples of this type. Standard turnaround time (per our SOW) is requested. To summarize:

- Sample Types:
- These samples are composited from various stacks around the laboratory.
  - They were taken as weekly samples during half of CY YYYY.
  - Preparation consisted of halving each weekly sample.
  - The filter material is glass-fiber.
  - There are 2 samples from prior composites included for confirming analyses.
  - There are XX samples that had zero stack flow (designated by "x" in number).

- Analysis Requirements:
- All samples are to be analyzed for the following constituents: Gross alpha/beta, Am-241, gamma-emitting nuclides, Pb-210, Po-210, Pu isotopes, Sr-90, Th isotopes, and U isotopes.
  - Detection limit requirements vary and are shown in the SOW.

- Screening Data:
- Alpha and beta screening data are shown in Chain of Custody and Screening Data For Composite Shipping.

- Shipping Data:
- For shipping purposes, we summed the alpha, beta, and gamma screening data and calculated results as nanocuries/gram.
  - A copy of the memorandum to our shipping department is enclosed.

If you require further information please contact me at (505) 665-8866 during working hours or Ernie Gladney at (505) 667-0295 during working hours or at (505) 672-1029 during off hours.

Sincerely

Debra Archuleta, MAQ Air Quality

Att: Chain of Custody and Screening Data